IN THE CLAIMS

1.-18. (Canceled)

19. (Currently Amended) A diffusion barrier comprising a plurality of stacked sub-layers, each sub-layer having a thickness of about 0.4 to about 1.5 ~~4.5~~ nm, which is predetermined to inhibit the formation of a crystalline lattice, to inhibit diffusion of a chemical species through the diffusion barrier, wherein the sub-layers are comprised of alternating layers of at least two different materials and the at least two materials selected to comprise the sub-layers are substantially immiscible and exhibit mutual adhesion, wherein the at least two different materials exclude TiN and TaN, and the overall thickness of the barrier is between about 30 and 50 angstroms.

20. (Canceled)

21. (Currently Amended) A diffusion barrier as in claim 19 ~~20~~, where one of the materials is scandium (Sc).

22. (Currently Amended) A diffusion barrier as in claim 19 ~~20~~, where one of the materials is copper (Cu).

23. (Currently Amended) A diffusion barrier as in claim 19 ~~20~~, where one of the materials is yttrium (Y).

24. (Currently Amended) A diffusion barrier as in claim ~~20~~, where one of the materials is lanthanum (La).

25. (Currently Amended) A diffusion barrier as in claim 19 ~~20~~, where one of the materials is tantalum (Ta).

26. (Currently Amended) A diffusion barrier as in claim 19 ~~20~~, where one of the materials is a metal nitride.

27. (Currently Amended) A diffusion barrier as in claim 19 ~~20~~, where one of the materials is an oxide.

28. (Canceled)

29. (Canceled)

30. (Withdrawn) An integrated circuit comprising a substrate, having an electrically conductive feature disposed on said substrate, further comprising a diffusion barrier interposed between said substrate and said electrically conductive feature, said diffusion barrier comprising a plurality of stacked sub-layers, each sub-layer having a thickness predetermined to inhibit the formation of a crystalline lattice.

31. (Withdrawn) An integrated circuit as in claim 30, where at least one of said sub-layers is comprised of a metal.

32. (Withdrawn) A circuit structure comprising a substrate and an electrical

interconnect comprised of copper (Cu), further comprising a diffusion barrier interposed between said substrate and said electrical interconnect, said diffusion barrier comprising a plurality of stacked sub-layers.

33. (Withdrawn) A circuit structure as in claim 32, where said sub-layers are comprised of copper (Cu) and tantalum (Ta).

34. (Withdrawn) A circuit structure as in claim 32, where said sub-layers are comprised of scandium (Sc) and tantalum (Ta).

35. (Withdrawn) A circuit structure as in claim 32, where said sub-layers are comprised of yttrium (Y) and tantalum (Ta).

36. (Withdrawn) A circuit structure as in claim 32, where said sub-layers are comprised of lanthanum (La) and tantalum (Ta).

37. (Withdrawn) A circuit structure as in claim 32, where at least one of the sub-layers is comprised of a metal nitride.

38. (Currently Amended) A multilayer diffusion barrier comprised of interfaces and atomically thin films in which surface adhesion of each interface inhibits the formation of a lattice in the films ~~individual film layers~~, inhibiting diffusion across the barrier, wherein thickness of each film is in a range of about 0.4 to about 1.5 ~~4.5~~ nm, wherein the films are comprised of alternating layers of at least two different

materials and the at least two materials selected to comprise the films are substantially immiscible and exhibit mutual adhesion, wherein the at least two material exclude TiN and TaN.

39. (Canceled)

40. (Canceled)

41. (Currently Amended) A multilayer structure comprised of three or more sub-layers each having a thickness of about 0.4 to about 1.5 ~~4.5~~ nm and an interface, wherein the interface of each of the sub-layers dominates a lattice formation on the sub-layers, preventing the formation of a lattice and grain boundaries, to inhibit diffusion of a chemical species through the structure, wherein each of the sub-layers excludes TiN and TaN, and is comprised of a metal.

42. (Canceled)

43. (Currently Amended) A multilayer diffusion barrier for inhibiting diffusion of chemical species there through, comprising a plurality of stacked layers comprised of alternating films of at least two different metals and excluding TiN and TaN, the thickness of each of said films being between about 0.4 to about 4.5 nm, which is predetermined to substantially eliminate work hardening.

44. (Currently Amended) A multilayer structure comprised of at least two films

forming a bond at an interface between each film, each film having a thickness of about 0.4 to about 1.5 ~~4.5~~ nm, wherein the interface dominates a lattice formation, inhibiting the formation of a lattice and grain boundaries, wherein the multilayer structure comprises alternating layers of at least two different materials excluding TiN and TaN, wherein at least one of the materials is a dielectric material.

45. (Canceled)

46. (Canceled)

47. (Currently Amended) The multilayer structure of claim 44 ~~45~~, wherein the at least two materials exhibit mutual adhesion and are substantially immiscible.

48. (Currently Amended) The multilayer structure of claim 44 ~~45~~, wherein at least one of the materials is a metal.

49 (Currently Amended) The multilayer structure of claim 44 ~~45~~, wherein at least one of the materials is a nitride.

50. (Canceled)

51. (Currently Amended) The multilayer structure of claim 44 ~~45~~ comprising three or more layers.

52. (Previously Presented) The multilayer structure of claim 44, having flexibility and inhibited work hardening.

53. (Previously Presented) The multilayer structure of claim 44, which is a diffusion barrier between two materials that are otherwise capable of combining chemically or between a layer and a surface capable of chemically combining with the layer.